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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/823,163	03/30/2001	Konstantine I. Iourcha	PA1744US	8104
22830	7590	04/21/2004	EXAMINER	
CARR & FERRELL LLP 2200 GENG ROAD PALO ALTO, CA 94303			MCCARTNEY, LINZY T	
			ART UNIT	PAPER NUMBER
			2671	

DATE MAILED: 04/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/823,163

Applicant(s)

IOURCHA ET AL.

Examiner

Linzy McCartney

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 10 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,5-8,12-25,27,30 and 31 is/are rejected.
- 7) ☒ Claim(s) 2-4,9-11,26,28 and 29 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 11.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

*Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 5-8, 12-15, 23-25, 27, 30 and 31 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,509,110 to Latham.

a. Referring to claim 1, Latham discloses representing depth information by a piecewise function, each piece of the piecewise function defining an area in an (x, y) space and representing depth information for the area of the (x, y) space (column 6, lines 40-56; Fig. 2); upon receiving a primitive object, dividing the primitive object according to areas defined by at least one analytical function, each analytical function representing depth information for the area of the primitive object (column 2, lines 52-58; column 3, lines 59-66); performing a visibility test based on depth information for the areas and updating the piecewise function based on the results of the visibility test (column 8, line 49 – column 9, line 7).

b. Referring to claim 5, Latham discloses performing a visibility test is accomplished by using a dynamic search structure to access overlapping areas (column 6, lines 10-55; Fig 2);

c. Referring to claim 6, Latham discloses wherein the dynamic search structure is a tree-based structure (column 6, lines 10-55; Fig 2).

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- d. Referring to claim 7, Latham discloses wherein each piece of the piecewise function is defined on a segment of a scanline (column 6, lines 40-56; Fig. 2; column 3, lines 46-63).
- e. Apparatus claims 8 and 12-14 are rejected with the rationale of the rejections of claims 1 and 5-7. Latham discloses an apparatus (column 11, lines 26-32).
- f. Referring to claim 15, Latham discloses a span generator configured to generate at least one span for each of the primitive objects, each span corresponding to a horizontal scan line occupied by the primitive object, the span characterized by position data and depth data (column 3, line 59 – column 4, line 2; column 11, line 26-33); a visible surface determination module responsive to the depth data associated with each of the spans and configured to determine at least one visible segment for each of the spans by comparing the depth information for the span with depth information for at least one area in an (x, y) space each area in the (x, y) space represented by a piece of a piecewise function, each piece of the piecewise function representing depth data for the area in the (x, y) space, and for generating position data corresponding to each of the visible segments (column 8, line 49 – column 9, line 7; column 11, lines 26- 32).
- g. Claim 23 is rejected with the rationale of the rejection of claim 1.
- h. Claim 24 is rejected with the rationale of the rejection of claim 1.
- i. Claim 25 is rejected with the rationale of the rejection of claim 1.

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- j. Referring to claim 27, Latham discloses wherein performing a visibility test further comprises determining visible portions of the primitive object (column 10, lines 26-37)
- k. Referring to claim 30, Latham discloses wherein each area is a region (column 3, lines 37-64).
- l. Referring to claim 31, Latham discloses wherein each area is a span (column 3, lines 37-64).

***Claim Rejections - 35 USC § 103***

- 3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

- 4. Claims 16-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Latham.

a. Referring to claim 16, Latham does not explicitly disclose storage means. It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the apparatus of Latham to a storage device, Official Notice taken. The suggestion/motivation for doing so would have been because Latham discloses using the graphics engine as a part of an digital image generator to drive additional circuitry for further calculation before outputting the data to the display (column 11, lines 19-25) and because it is necessary to include storage to store the intermediate calculation results and the final output for future processing.

b. Referring to claim 17, Latham discloses a graphics engine configured to generate at least one span for each of the primitive objects and to perform visual surface determination by comparing depth information for at least one span with depth information for areas in an (x, y) space, each area in the (x, y) space defined by a piece of a piecewise function, each piece of the piecewise function representing depth information for the area in the (x, y) space (column 8, line 49 – column 9, line 7; column 11, lines 26- 32). Latham does not explicitly disclose a processing device, a display device coupled to the processing device, or a storage device. It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the apparatus of Latham to include a processing device, a display device, and a storage device, Official Notice taken. The suggestion/motivation for doing so would have been because Latham discloses using the graphics engine as a part of an digital image generator to drive additional circuitry for further calculation before outputting the data to the display (column 11, lines 19-25) and because it is necessary to include storage to store the intermediate calculation results and the final output for future processing.

c. Referring to claim 18, Latham discloses wherein the graphic engine further comprises a span generator configured to generate spans for each primitive object corresponding to horizontal scanlines of the primitive object (column 3, line 59 – column 4, line 2; column 11, line 26-33).

d. Referring to claim 19, Latham discloses wherein the graphics engine further comprises a visible surface determination module coupled to the span generator, the visible surface determination module configured to determine at

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least one visible segment for each span (column 8, line 49 – column 9, line 7; column 11, lines 26- 32).

e. Referring to claim 20, Latham discloses storing the results of the visual surface determination in a linked list format (column 6, lines 44-59; Fig. 3).

f. Referring to claim 21, Latham discloses storing results of the visual surface determination in a binary tree format (column 6, lines 10-55; Fig 2).

g. Referring to claim 22, Latham discloses wherein the results of the visual surface determination comprise information indicative of relative depth of a first visible segment in relation to a second visible segment (column 8 line 49 – column 9, line 7).

#### ***Allowable Subject Matter***

5. Claims 2-4, 9-11, 26, 28-29 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Linzy McCartney** whose telephone number is **(703) 605-0745**. The examiner can normally be reached on Mon-Friday (8:00AM-5:30PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Mark Zimmerman**, can be reached at **(703) 305-9798**.

**Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks

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Washington, D.C. 20231

**or faxed to:**

**(703) 872-9314 (for Technology Center 2600 only)**

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

ltm

April 15, 2004

*Mark Zimmerman*  
MARK ZIMMERMAN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600